# Buk-M1-2

Air Defence Missile System

## Mission

The Buk-M1-2 air defence missile system is designed to protect task forces and installations against mass attacks of existing and prospective high-speed manoeuvring strategic and tactical aircraft, helicopters, including hovering ones, tactical ballistic and air-launched cruise missiles, under intensive electronic and fire counteraction, as well as to destroy radio-contrast surface and ground targets, in any weather conditions, by day and night.

Buk-M1-2 is a state-of-the-art mobile multi-channel medium-range ADMS capable of providing highly effective anti-aircraft and anti-tactical ballistic missile defence.

| Basic specifications | |
|---|---|
| Max target detection range, km | up to 160 |
| Aerodynamic target engagement envelope, km: | |
| range | 3 – 42 |
| altitude | 0.015 – 25 |
| Ballistic target engagement envelope, km: | |
| range | up to 20 |
| altitude | up to 16 |
| Max engagement range, km: | |
| antiradiation and cruise missiles | up to 20 |
| radio-contrast ground targets | up to 15 |
| surface targets (missile boats, destroyers) | up to 25 |
| Max air target speed, m/s | 1,200 |
| Warhead weight, kg | 70 |
| SAM load factor, g | up to 30 |
| Number of SLVs controlled and targets engaged simultaneously | up to 6 |
| ADMS reaction time, sec | up to 18 |
| Into/out-of-action time, min | 5 |

## Composition

- combat assets
- support assets

Typical combat assets include:

- 9S470M1-2 command post;
- 9S18M1-1 target acquisition radar;
- up to six 9A310M1-2 self-propelled launch vehicles;
- up to six 9A39M1 launcher-loader vehicles, assigned to SPLVs;

- up to 72 9M317 surface-to-air missiles, carried on SPLVs (up to four on each) and LLVs (up to eight SAMs with four of them ready-to-fire on launch rails).

The support assets include maintenance and repair assets for the ADMS main elements, including tracked vehicles.

A group of up to four ADMS is provided with the following support assets:

- maintenance and repair facilities for the ADMS elements, and an automated integrated missile test and monitoring system;
- missile storage and transportation means (with rigging equipment to load/unload the missiles);
- training facilities;
- a group set of spare parts, tools and accessories for the ADMS elements.

# PECHORA-2M/PECHORA-2K

Air Defence Missile System Upgrades

## Mission

The modernisation programme for the S-125 Pechora air defence missile system developed by the Kuntsevo Design Bureau, envolves two variants: self-propelled Pechora-2M (S-125-2M) and containerised Pechora-2K (S-125-2K).

The S-125 Pechora ADMS upgrades are designed to protect administrative, industrial and military installations against air strikes by aircraft, helicopters and cruise missiles (including stealth ones) in simple and complex jamming conditions.

## Basic specifications

| | Pechora | Pechora-2K/Pechora-2M |
|---|---|---|
| Min target RCS area, sq.m | 0.5 | 0.1 – 0.15 |
| Engagement envelope, km: | | |
| range | 3.5 - 25 | 3.5 - 30/32* |
| altitude | 0.02 - 18 | 0.02 - 20 |
| course parameter | 16 | 16.5 |
| Max target speed, m/s | 560 | 700 |
| Target acquisition time (lock-on/autotracking), s | up to 8 | not more than 3 |
| Anti-jamming capacity, W/MHz | 200 | 2000 |
| Number of target/missile channels | 1/2 | 1/2 (2/4)** |
| Number of missiles on one launcher | 4 | 4/2 |
| ECCM system antiradiation missile deviation probability (attack from two directions) | - | 0.96 – 0.98 |
| Into/out-of-action time, hrs | 3 | 3/0.5 |

* – with the upgraded 5V27DE SAM

** – with the second UNV-2M antenna post included

The upgraded systems feature improved performance:

- combat efficiency is improved thanks to employment of the 5V27DE upgraded surface-to-air missile with expanded kill envelope;
- enhanced survivability is provided by introducing advanced electronic, optronic and ECCM equipment;
- tactical mobility is increased for the Pechora-2M ADMS by mounting its principal units on the wheeled chassis equipped with autonomous power supply units, satellite navigation equipment;
- into/out-of-action time is reduced considerably due to fewer cabin-to-cabin cable links;
- enhanced reliability and prolonged service life are obtained thanks to wide application of modern electronic components in basic units;
- operational and maintenance characteristics are improved by reducing maintenance/servicing time thanks to the introduction of automated test equipment and providing smooth spare parts supply.

## Upgraded Systems Composition

- SNR-125M-2M(K) missile guidance radar, comprising: UNV-2M antenna post (self-propelled wheeled variant), or UNV-2K antenna post on a semi-trailer with a tractor (containerised variant), upgraded UNK-2M control cabin on wheeled chassis
- SM-RB-125-2M(K) missile battery, comprising:
  - up to 8 5P73-2M launchers with two guiding rails each (self-propelled wheeled variant), or up to 4 launchers with 4 guiding rails each on semi-trailers with a tractor (containerised variant);
  - up to 8 transporter-loader vehicles on the ZiL-131 or Ural-4210 chassis (self-propelled variant), or PR-14AM on ZiL-131 automobile chassis (containerised variant);
  - 5V27D/5V27DE SAMs;
  - power supply system, consisting of the RKU-N distributive cabin and 5E96A diesel-electric power station, KU-03T cable layer (containerised variant).

The PRM-NM1A mobile repair shop with a single SPTA set, sets of cables, and an ECCM system are offered optionally.

Thanks to the introduction of the second UNV-2M antenna post, the upgraded ADM systems enjoy enhanced channel capacity: two target channels, and up to four missile channels.

On customer request, the ADM system delivery set can be changed to include foreign-made equipment, chassis, materials, software, components, etc.

# PECHORA-2A

Air Defence Missile System Upgrade

## Mission

The S-125-2A Pechora-2A upgraded air defence missile system is designed to provide AD cover for administrative, industrial and military installations against air attacks of aircraft, helicopters and cruise missiles under simple and heavy ECM conditions.

The S-125 Pechora ADMS modernisation programme is developed by the Raspletin Almaz Scientific Production Corporation to enhance tactical and technical parameters of the basic system.

## Basic specifications

| | Pechora | Pechora–2A |
|---|---|---|
| Min target radar cross section, sq. m | 0.5 | 0.5 |
| Engagement envelope, km: | | |
| range | 3.5 - 25 | 3.5 - 28 |
| altitude | 0.02 - 18 | 0.02 - 20 |
| course parameter | 16 | 24 |
| Max target speed, m/s | 560 | 700 |
| Target acquisition time, s | up to 8 | 2,5 - 3 |
| Anti-jamming capacity, W/MHz | 200 | 2,000 |
| Number of target/missile channels | 1/2 | 1/2 |
| Number of missiles on one launcher | 4 | 4 |
| Into/out-of-action time, hrs | 3 | 3 |

The upgrading of the S-125 Pechora system envisages:

- extension of ADMS engagement zone by introducing improved missile guidance methods;
- enhancement of target kill probability (including low-altitude targets) by improving SAM guidance accuracy;
- augmented capability to detect and track air targets in conditions of intensive jamming and passive interference, including meteoghosts and background clutter;
- improved ADMS performance in the TV/optical mode thanks to introduction of automatic target acquisition and tracking into the TV channel;
- improvement of operational characteristics, including partial automation of combat work; substitution of some units with up-to-date hardware; upgrading of the crew training facilities; reduced volume and duration of scheduled maintenance works; enhancement of operational reliability; prolongation of service life; reduction of power consumption.

## Composition

- SNR-125M-2A missile guidance radar comprising UNV antenna post, upgraded UNK-M2A control cabin and mobile repairs workshop
- air defence missile battery including up to four 5P73 launchers and up to 8 PR-14AM transporter-loader vehicles on wheeled chassis
- 5V27D SAMs
- electrical power supply system consisting of the RKU-N distribution cabin, 5E96A diesel-electric power station and 5E74M-230 mobile transformer unit

The KU-03T cable layer with a set of cables can be delivered additionally.

At customer request, delivery set of the S-125-2A Pechora-2A ADMS can be supplemented with foreign-made equipment and facilities.

The upgrading of the S-125 Pechora ADMS can be conducted both in Russia and on the customer territory.